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Vicksburg District
Corps of Engineers

Arkansas Red
River Commission

## FULTON

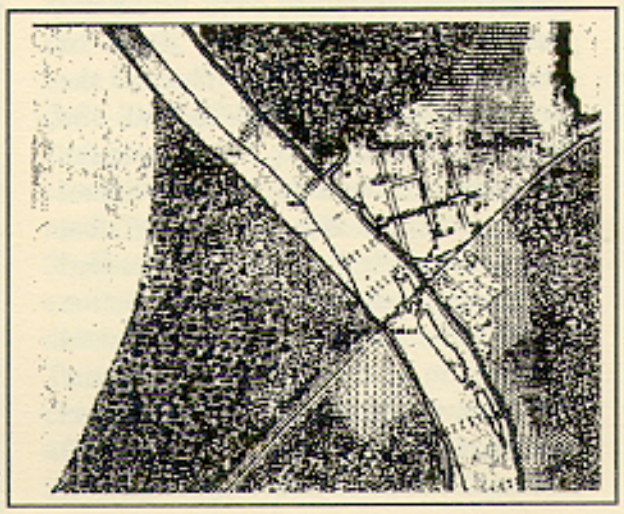
Fulton was founded in 1819 as a speculative venture on the part of Missouri businessmen James Bryan, William O'Hara, and Robert Andrews. The reason for the selection of the site is given in a December 11, 1819, *Arkansas Gazette* advertisement for the sale of town lots, which describes Fulton as the principal landing for the import and export freights of Hempstead County and the principal entrance to Texas from the Missouri Territory. This was the old Hempstead County, which encompassed the southwest portion of the state and was soon to develop into one of the two most important cotton producing areas in the state. The entrance to Texas was the Southwest Trail, which preceded the formation of the town and was continued on the other side of the river by Trammell's Trace.

Fulton was the most important of the ports and landings on the upper Red River during the steamboat period. All steamboats that went to the upper Red River stopped there because it was the first port above the Red River Raft and because it was the place where it could be determined whether conditions above Fulton were favorable for proceeding upstream. The import and export freights of Southwest Arkansas passed through Fulton, and freights were stored there when the upper Red was not accessible.

In spite of these advantages, Fulton never became a town in the conventional sense; that is, it never developed a large resident population with churches, schools, and newspapers. This was because it suffered from the commercial limitations of all ports and landings above the raft and did not control a large market area. Steamboats could stop at many other ports and landings on the Red, on Little River and its tributaries, and on the Ouachita River to the east. All of these provided competition with Fulton for the trade of Southwest Arkansas. Consequently, Fulton remained modest in size, never achieving sufficient population during the steamboat period to be included as a separate entity in the census.

Fulton developed slowly during its first 15 years. It was at first a keelboat port and then visited occasionally by steamboats beginning in 1831. However, it did not achieve substantial development until 1835, when it became apparent that Henry Shreve would be successful in removing the raft. A new town plan was created by new town developers, and town lots began to be sold rapidly. A ferry was established in 1836. Although temporary, the removal of the raft allowed steamboats to reach Fulton direct by river from New Orleans and established Fulton as a steamboat destination in the New Orleans newspapers.

The first description of Fulton is given in September 1846 by William McClintock, who mentions two warehouses, three grocery stores, four cabins, and one blacksmith shop. The two warehouses, which stored import and export freights, were distinctive features of Fulton and were located at the upper and lower landings in town. The warehouses were operated by receiving, forwarding, and commission merchants, who were responsible for freight transfers from and to the steamboats that operated on the river and the ox and mule wagons that operated on land. These merchants also acted as steamboat agents and provided housing for teamsters and yards for their teams.



Both of the warehouses were frame structures. The year of their origin and their first occupants are unknown because of an absence of newspapers from the 1830s. In 1841, the upper warehouse was operated by Chambers Etter, with his advertisement indicating that the warehouse had been formerly operated by Hayward & Kopman. The lower warehouse was operated by Searing Marsh and Samuel Applegate, the latter of whom became a famous Red River captain.

The grocerys mentioned by McClintock were actually general mercantile stores, selling dry goods, groceries (including liquor), hardware, and drugs for cash, credit, or bartered produce (cotton, furs, pelts, beef hides, beeswax, bearskins, bear oil). Two of these stores were frame structures, but one was brick. The first known owners (in the early 1840s) were William Street, William Norman, and G. F. Rogers. Street referred to his store as the Cheap Cash Store; and Norman, who occupied the brick structure, referred to his store as the Fashionable Fancy Store.

Although ownership changed over time, Fulton's basic business structure of two warehouses and three stores did not change during the steamboat period. The only thing that needs to be added to round out McClintock's picture is a doctor in 1842, a tailor in 1845, a tinner in 1849, and two hotels. The hotels in the early 1840s were known under the names Fulton House (later Union Hotel) and Cross Keys Tavern. The tavern burned in 1848 at a loss of $250 (about $5,000 in current dollars) and was replaced by Nelson's Hotel. The hotels provided lodging for boarders and land and water travelers and included stables.

Fulton's function as a port ended in April 1873 when the Cairo & Fulton Railroad was completed to Fulton. This connection enabled the cotton of Southwest Arkansas to be transported to St. Louis by rail rather than to New Orleans by steamboat. The accompanying map, which was prepared in 1886, shows Fulton's modest dimensions.

## ENGINEERING STUDIES NEARING COMPLETION

To provide navigation on the upper Red River, it will be necessary to construct a series of locks and dams. The dams produce pools of water with sufficient depth for waterborne traffic to pass through them. The pools are stepped, with increasingly higher elevations as one moves upstream. Lift is the difference in elevation between the pools. The locks are chambers that are filled and emptied as needed to provide the lift that enables vessels to pass from one pool level to another. This lock and dam system would be continuous with the existing navigation project, with the first dam located at the point above Shreveport-Bossier City where pool effects of the J. Bennett Johnston Waterway end.

| Plan | Navigation to: | Structure No. | 1967 Mileage | Downstream Pool | Upstream Pool | Lift (ft) |
|---|---|---|---|---|---|---|
| A | Garland | L&D # 6 | 299 | 145 | 175 | 30 |
| | | L&D # 7 | 340 | 175 | 199 | 24 |
| B | Fulton | L&D # 6 | 299 | 145 | 175 | 30 |
| | | L&D # 7 | 340 | 175 | 196 | 21 |
| | | L&D # 8 | 368 | 196 | 222 | 26 |
| D | Fulton | L&D # 6 | 299 | 145 | 185 | 40 |
| | | L&D # 7 | 354 | 179 | 222 | 37 |
| E | Index | L&D # 6 | 299 | 145 | 179 | 34 |
| | | L&D # 7 | 346 | 179 | 213 | 34 |

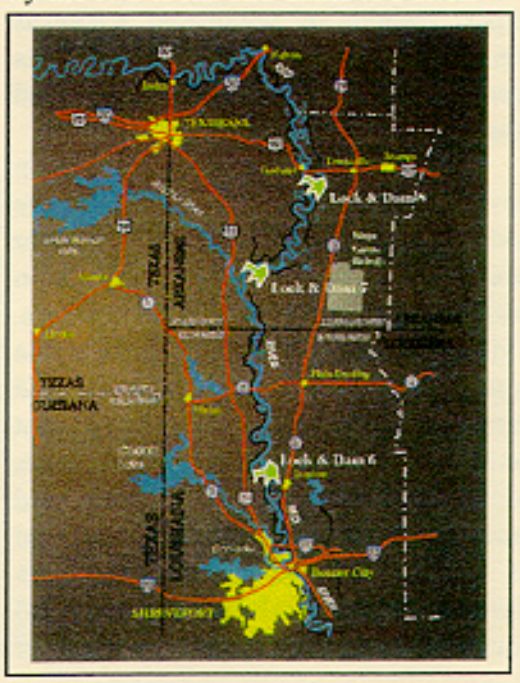
The location and design of the locks and dams has been one of the primary features of the engineering studies for the Southwest Arkansas Navigation Study, which is nearing completion. The studies were conducted in four phases. The first phase identified dam locations and pool elevations that would enable navigation to termination points at Garland, Fulton, and Index, all in Arkansas. The second phase examined innovative construction methods and designs. The third phase concentrated on the engineering investigations for the first lock and dam in the system and the pool created by this lock and dam. In addition, post-project water surface profiles for various flows for the entire waterway under study were computed during this phase. The fourth phase concentrated on engineering investigations for the remaining locks and dams.

Originally, five different alternatives were studied. The first would employ two locks and dams to provide navigation to Garland. The second would employ three locks and dams to provide navigation to Fulton. The third would employ two locks and dams to provide navigation to Fulton, with the dams spaced to provide equal lifts (changes in elevation) in moving from one pool to another. The fourth was similar to the third, with two locks and dams to Fulton, but did not incorporate the lift uniformity feature. The fifth would employ three locks and dams to provide navigation to Index. The basic data for the major alternatives (other than the third) are provided in the accompanying table.

The detailed engineering analyses have concentrated on the alternatives for Garland and Fulton because it was found that most of the project benefits could be realized through points below Index at lower cost. In addition, the uniform lift alternative was dropped from consideration because it was found that identical locks and dams would not provide much in the way of construction cost savings. This left the two locks and dams to Garland, the three locks and dams to Fulton, and the two locks and dams to Fulton (without uniform lift) as the alternatives that were carried forward in the detailed engineering analyses. The construction of two locks and dams to Fulton would be lower in cost than three locks and dams, but would require greater lifts in moving from one pool to another (40 feet and 37 feet, respectively, at the two lock and dam sites) and would also have greater impacts on adjacent land and levees.

The accompanying illustration shows the location of the locks and dams for the three locks and dams alternative to Fulton. Moving upstream, the pool that would be formed upstream of the first dam would be at an elevation of 175 feet National Geodetic Vertical Datum (NGVD). The pool that would be formed by the second dam would be at 196 feet, and the pool formed by the third dam would be at 222 feet NGVD. The two lock and dam alternative to Garland would use the same locations as the two lower locks and dams in the illustration, but with a lower pool at 175 feet NGVD and an upper pool at 199 feet NGVD. The two locks and dams alternative to Fulton would use the same location as the lowest lock and dam in the illustration, with a pool at 185 feet NGVD. The second dam for this alternative would be 14 river miles above the second dam in the illustration, with a pool at 222 feet.

The three alternatives would have different effects on the land adjacent to the river. The major difference between the alternatives is that the pools created by the two locks and dams to Garland and the three locks and dams to Fulton would be largely contained within the existing river banks, whereas the upper pool created by the two locks and dams to Fulton



would be out of banks. Investigations are underway to determine whether the cost savings of two locks and dams to Fulton would be outweighed by the attendant cost for upgrading the river's levees and the disturbances that might be caused to groundwater levels in the area.

## TRANSPORTATION COST SAVINGS

Transportation cost savings are the key element in determining the feasibility of a navigation project. Transportation cost savings are the differences in costs of moving a commodity by water from one point to another compared to the costs of moving the same commodity by different transport modes such as truck or rail. Transportation cost savings over the 50-year life of a project are compared to the construction and operation and maintenance costs over the life of the project to produce a benefit-to-cost ratio. If the benefits equal or exceed the costs, the project is deemed economically feasible.

To determine transportation cost savings, it is first necessary to obtain information from existing businesses and industries in a region on the tons of existing or potential commodities that could move on the waterway, along with origin and destination points. For the Southwest Arkansas Navigation Study, this information was obtained by the Arkansas Red River Commission from businesses and industries in the 24-county region shown in the accompanying illustration. Businesses and industries in the region identified 19 million tons that currently move into or out of the study area. This information was submitted to the Vicksburg District, which conducted a cost savings analysis for each potential movement, and these analyses were reviewed by a transportation rate specialist with the Tennessee Valley Authority.

This process resulted in the identification of 5.7 million tons for which there would be transportation savings if the commodities were moved on the proposed waterway. The identified commodities and their respective tonnages were as follows: Food and Kindred Products (1.1 million tons); Construction Materials (1.7 million tons); Petroleum and Coal Products (0.8 million tons); Primary Metal Products (0.2 million tons); Rubber and Miscellaneous Plastics (0.08 million tons); Lumber and Wood Products (1.7 million tons); and Paper and Allied Products (0.06 million tons).

Most of these tonnages would be outbound commodities from the Arkansas portion of the region. Tonnage to be transported by water could increase as much as 100 percent by the end of the 50-year life of the project. The dollar savings in transport costs over the life of the project are presently being refined and compared to the construction and operation costs of the various alternatives to determine if any of the alternatives are economically feasible.

Vicinity Map

## FISHERIES STUDY COMPLETED

The construction of dams on the Red River below Shreveport-Bossier City has transformed a turbid stream with highly fluctuating water levels into a series of lakes with increased clarity and depth. Riverine habitats for fish have been transformed into lacustrine (lake-like) habitats. These habitat changes have produced significant changes in the relative abundance of naturally occurring species in the river. Similar changes in fisheries can be expected through the construction of dams above Shreveport- Bossier City. To determine the nature of these changes and the species that would be affected, field studies were conducted in the uppermost pool created by the existing navigation project and in the unimpounded reaches of the river extending to Index, Arkansas. This procedure allowed for a comparison of the fish communities in the upper Red River under impounded and unimpounded conditions so that conclusions could be drawn about the likely effect of dams above Shreveport-Bossier City.

Fish were collected on a seasonal basis using seines, gill nets, and trotlines baited with night crawlers. Large specimens were identified, measured, and released in the field. Small specimens and large specimens of special interest were sent to a museum in Monroe. Hydraulic characteristics (depth, velocity, channel width) and water quality (temperature, conductivity, dissolved oxygen, and pH) were measured at each sampling location concurrently with fish collections.

Sixty fish species were documented in the study area. Some were abundant and broadly distributed, including minnows (bullhead minnow, chub shiner, red shiner, silverband shiner), inland silverside, and shad (gizzard and threadfin). Abundance and composition of other species varied between pool and river reaches. Recreational fishes (bluegill, largemouth bass, crappie, channel and blue catfish) were more abundant in the pool, and commercial fishes (buffalo, carpsuckers, gar) were more abundant in the riverine reaches.

Although the number of species was similar between the pool (49 species) and river reaches (52 species), certain species occurred exclusively in the river. These were mostly darters (4 species) and riverine minnows (2 species), but included one exotic species (grass carp). Other species that typically prefer swiftwater environments were substantially more abundant in the river reaches, including three species that have declined in abundance throughout their range: blue sucker, shovelnose sturgeon, and western sand darter. Paddlefish, another species of special concern, were collected in oxbow lakes.

With construction of the project, species adapted to high turbidity and widely fluctuating flows (sturgeons, most suckers, darters, riverine minnows) will decline in abundance. Species that migrate during the spawning season (paddlefish, sturgeon, suckers) will be hampered by the dams. Conversely, populations of sight-feeding or slackwater fishes such as sunfishes (bluegill, crappie, largemouth bass) and temperate basses (white bass and striped bass) will increase. Thus, the project would result in biological tradeoffs, with lacustrine species dominating the fish community in the pools created by the project. Recreational fishing opportunities would increase.

If you would like more information on the study, please contact:

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You are invited to visit the Southwest Arkansas Navigation Study webpage at: http://www.mvk.usace.army.mil/offices/pp/projects/swark/index.htm

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